COST AND MANAGEMENT

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The author is Administrative Accountant in the Budgetary Control Department of The Ryan Aeronautical Co., San Diego, Calif., which company he joined in 1953. Prior to this, he was Cost Analyst with the First National Trust and Savings Bank of San Diego for five years and Job evaluation engineer with Western Electric Co., Chicago, for one year.

Mr. Liebster joined the Ansco Division of General Aniline & Film Corporation in 1951. He served first as cost accountant and in 1953 was appointed to his present position of Methods Analyst. Prior to his entrance into the United States in 1949 he served in various administrative capacities with the United Nations Organization in Germany. He was educated at the University of Geneva, Switzerland, and is a graduate of the State University of New York.

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Editorial Comment . . .

EDUCATIONAL CRISIS

It is extremely easy today for Canadians to be vain of their industrial promise. Every paper, every magazine, every public speaker, unrolls ad infinitum and sometimes ad nauseum great masses of statistics extolling our great national wealth in minerals, waterpower and forests. Of late another set of statistics have been creeping into the picture of industrial Canadiana which is not so gratifying and even disturbing.

A serious disproportion exists between our ability to produce technical and professional people and the requirements of our expanding economy for them. For example, based on proportional populations, Russia has four times as many enrolled in schools of higher learning as has Canada. The United States has nearly three times as many.

About 6½% of the Canadian population attends University. Some students of the subject claim at least double the present number will enter in another ten years.

Most of the studies to date have been pointed to the shortages in the engineering profession, and to elaborate on the entire situation would require a major article. To narrow down the field let us analyze the situation as far as the accounting profession is concerned and more specifically the place of S.I.C.A. in the educational scheme.

The same characteristic supply and demand picture is evident even if, along with a famous wit of another day, "all we know is what we read in the newspapers." Numerous positions are available every day — comptrollers, chief accountants, cost accountants, budget directors, methods and systems supervisors and so on. Surveys on business and professional needs both in this country and the United States show that accounting and business administration graduates are in great need, and rank only second in demand to those from the engineering faculties.

For many years the public accounting bodies were the one substantial source of supply for trained professional and executive accountants. S.I.C.A. was formed over thirty years ago to provide additional educational facilities for the training of professional accountants, and in particular, those wishing to specialize exclusively in industrial accounting problems. Since those days and particularly since the war, a major contribution has been made by the Society towards the instruction of men and women in accountancy and management.

In 1951 for example, the student enrollment was 1,490 and in 1956 it rose to 3,459, an increase of 138% in a short five year period, or an average 18% cumulative increase per year.

It is rather interesting to comment on how this considerable body of students is handled academically and whether or not the courses as presently constituted, offer the best long range plan for Canadian accounting needs.

S.I.C.A. is rather unique in its instruction programme in that both business and university share in the educative process. Classes are both intra and extramural in order to provide the widest possible opportunity for all who can qualify, to receive training. Where university classes are possible, teaching is shared by business men of suitable academic background and by regular university instructors. Many of these outside instructors are business leaders in large corporations. The blend of practicality and academics thereby achieved is of a very great value to the professional and industrial accountant.

It is also evident that such a system, while accomplishing its purpose of adequately training financial men does not tax the resources of the universities to any appreciable extent. In view of the shortage of college facilities and instructors this fact is of importance to the general cause of education, as well as the future supply of accounting personnel.

There is another aspect of this shortage problem that should cause both industry and the colleges some consideration.

How well are we using the present graduates? Such has been the unprecedented growth of many industries in Canada that business leaders of late have tended to snap up all the technical men they can get, regardless of whether they presently need them. As a result many highly trained men with excellent records and experience find too little to do on jobs and insufficient daily challenges to keep them interested. Management has not, and is not using them to the full. In some settings they are given junior work and assignments often rationalized as training or they are lulled with promises of promotion.

The solution is obvious — do not waste the time of professional men on work of lesser calibre and employ more middle and junior men.

There is perhaps a thought here for the Society as well. Perhaps S.I.C.A. could alleviate this shortage of trained help by developing an intermediate certificated course. This would be designed to meet the needs of those who given semi-specialized training could well take over the more routine duties of the professional men.

It obviously also would satisfy by far the greater number of accounting positions available in industry. This type of training would stress the importance of technical and vocational aspects of the finance world.

We have a grave shortage in Canada of trained personnel due to rapid industrial growth, both extractive and manufacturing. We also lack sufficient facilities to cope with the problem.

Perhaps however, in the world of accountancy a system of shared instruction such as S.I.C.A. promotes will help. Perhaps we need, as well, a realistic look at the requirements of industry and to design our courses to meet those requirements.

C. & M. Round-Up . . .

By N. R. Barfoot

LOOKING AHEAD

29½ billion G.N.P. is in sight for this year.

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Picture Phones are on the way—screens about four inches—a switch will let you see your party or vice versa.

—o—o—

White Collar Workers will be in the majority in union ranks within a generation thinks one large union body. Automation and the intensification to unionize office workers will do the trick.

—o—o—

Vesuvius erupts again in '57—Former eruptions have heralded breaks in business booms 1872, 1906 and 1929. A new kind of economic forecasting.

—o—o—

The St. Lawrence open all year—is a possibility. The know how is available, the equipment by way of ice breakers is not. Even now the channel from the ocean to Quebec City is almost always open. From Quebec City to Montreal ice breakers help to keep the narrow channel open except for a few days each year.

Some changes in ship construction would be necessary; more power and stronger hulls along with recessed propellers are the answer.

About three more ice breakers could be used.

The crux is the traffic load. When this is big enough undoubtedly the river will be kept open.

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The Suez Crisis may have a far reaching effect on Canada. For example, Canadian Oils will be in great demand if difficulties are encountered in supplying the world with Middle East Oil. It could mean a flow of foreign capital to Canada at a great rate to boost oil production.

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THE OLDSTERS

Recent studies in the United States on problems of older people reveal the following:

Three-fourths of those over 65 have no income—or less than $1,000.00 per year.

Employment still provides the greatest share of their income.

52% of all the aged are women. Over 70 the proportion is much greater, most of these women and one-third of the men being widowed or single.

Employment is at a maximum for men between 25 and 54 with all but 5% working.

56% of all men between the ages of 63 and 69 are still working and 40% of those in the 70 to 74 year bracket are gainfully employed.

Past 75 the proportion of employed drops below 20%.

The number of people receiving old age pensions in Canada is about 93,000.

The Federal Government contributes per annum, over 20 million dollars.

MANAGEMENT GRANTS TO COLLEGES AND UNIVERSITIES

A report by the council for financial aid to education in the United States shows some interesting figures on the increase in aid by corporations to educational institutions:

Some 42 companies last year gave over 21 million compared to 8 million by 38 companies in 1952.

Some 42 companies gave nearly 2½ million in unrestricted donations in 1955, compared to a little over one million in 1952.

In order of purpose—donations were:

For building and other capital projects
Graduate Fellowships
Undergraduate Scholarships
Research
Teaching Aid
Faculty and Staff Compensation
Various types of student loans.

Typical comments by corporations making grants are: We feel a responsibility to help support colleges and universities, many of which supply us with the trained personnel we need year after year; It is not possible to get an immediate return on investments in everything; It is not good business to be niggardly.

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SHORTAGE OF PROFESSIONAL MEN

The recent conference on Engineering, Scientific and Technical manpower at St. Andrews in New Brunswick developed some figures that are somewhat alarming.

More than 50% of Canadian employers are having trouble getting staff.

47% of the companies reporting showed curtailment of production and expansion plans.

33% report cutting back on planning and research.

24% report overloading of present personnel.

Mechanical Engineers are hardest to find according to 40% of the companies reporting with electrical, mining and metallurgical next hardest.

From 1948 to 1952 shortages were sporadic.

The situation tightened in 1953, eased back in 1954 due to fall off in business and in 1955 twice as many vacancies were registered with N.E.S. as there were applications.

77% of all engineers work for industry, 19% for Government, 4% are in education.

In 1956—1,650 graduated from university and this figure should reach 3,100 by 1965 with anticipated increases in college enrolment. Biggest problem will be buildings and staff to handle the increase.

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ON THE PERSONAL SIDE

Executive Health Check List

1. Learn and apply the rules of good nutrition.
2. Keep your weight within safe limits.
3. Know the value of a change of pace and scene.
4. Tranquillize your home—attempt to achieve peace and simplicity.
5. Remove all sources of unnecessary strain.

6. Entrust your health to a competent and understanding physician.
7. Have a thorough health examination at regular intervals.
8. Don't neglect minor ailments or physical defects.
9. Be alert for the earliest signs of emotional breakdown.

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Liberal Arts Education—will get greater emphasis say educators; specialization vogue is on the wane in favour of broad cultural approach.

—o—o—

Absenteeism Costs Millions each year—
A small number of workers are responsible.
Workers under 20 have the highest rate.
Those over 50 lose fewer days than any group.
Women are absent more than men.
The day after pay day and Mondays are the most popular days off.

The One Millionth New Home since war's end was recently opened. Every fourth Canadian family lives in a house less than ten years old. Total outlay—nearly 15 billion for these homes.

PERSONALS

R. H. A. Humphries, R.I.A., has been appointed Office Manager controlling all projects of Gilpin Construction Co. Ltd., Vancouver. Mr. Humphries is past chairman of the Vancouver chapter.

L. A. Milne, B. Com., of the Vancouver chapter has been appointed Office Manager of J. Boshard & Son. He was formerly with Shiels Trucking Co. Ltd.

Gordon B. Clarke, C.A., chairman of the Montreal chapter, has been appointed Assistant Secretary-Treasurer of Dow Brewery Limited.

A. W. Babcock, R.I.A., of the Toronto Chapter has joined Minneapolis-Honeywell Regulator Co. Limited, Leaside, Ontario, as Contracts Administrator. Mr. Babcock was formerly with Rogers Majestic Electronics Ltd.

R. L. Boynton, C.A., formerly with the Hamilton General Hospital, has been appointed Chief Accountant of Jay Manufacturing Co., Galt, Ontario. He is a general member of the Hamilton chapter.

W. C. Hesler, R.I.A., has joined Sklar Furniture Limited, Oshawa, Ontario, as Controller. Mr. Hesler was formerly employed by E. D. Smith & Sons, Limited, Winona, Ontario.

J. E. Sutherland of Canadian Westinghouse Co. Ltd., Hamilton, Ontario, has been elected president of the Hamilton chapter of N.O.M.A.

Books in Review . . .

MANAGEMENT IN ACTION

By Lawrence A. Appley, published by the American Management Association, New York, 1956.

Reviewed by R. A. McKINLAY, B.A.Sc., M.Comm., P.Eng.

Lawrence A. Appley, President of the American Management Association, is also an experienced business executive, having held senior positions in several large corporations prior to accepting his present post. He is a qualified lawyer, holds an Ll.D. from Ohio Wesleyan University, and was honoured by President Truman with the Medal of Merit. His book, *Management in Action*, is a selected collection of his writings which have appeared from time to time in various A.M.A. publications.

Mr. Appley firmly believes that to reach its fullest development, management must practice certain fundamental philosophies—the most important being the application of the *Golden Rule* to business problems—"Do unto others as you would have them do unto you".

He has defined management as the science of "getting things done through the efforts of other people". Being a science, management must have certain basic principles. Mr. Appley has illustrated these in such a way as to be meaningful and useful to student, supervisor, manager, or president; as a text book from which to learn the principles of management, as a help to solve daily problems, as a yardstick to measure the effectiveness of an organization, or as an aid in planning future operations.

In a large number of companies the responsibility for the personnel function has been assigned to a staff specialist, the Personnel Manager. Mr. Appley strongly believes that personnel management is the major function of the line supervisor, and should not be delegated or assigned to a specialist. The duties of the specialist should be those of a staff advisor, but the responsibility for decision must rest with line management. The line supervisor must be able to handle his own personnel problems or he is not doing his job. To quote the author, "Working satisfactorily with people is not part of the management job—it is the entire job!" This idea permeates the whole book, and is developed and illustrated so that there can be no doubt about its truth.

If labour leaders would read this book sincerely, and if management would make a serious effort to carry out the philosophy therein, a big step would be taken towards labour-management understanding, resulting in increased productivity, benefitting labour, management, and the community.

This book is a must for any person sincerely interested in the management function.

COST AND MANAGEMENT

CANADIAN ACCOUNTING PRACTICE

By W. G. Leonard, F.C.A., and Frank N. Beard, B. Com., C.A.I., The McGraw-Hill Company of Canada Limited, Toronto, 1956, *p.p.* 494.

Reviewed by CALVIN POTTER, Ph.D., B.Sc. Com., M. Com., C.A.

In the past few years there has been a persistent demand for a new introductory text book in accounting presenting the Canadian point of view. In their book *Canadian Accounting Practice,* Professors Leonard and Beard have written a text book to fill this demand. Its publication, therefore, is a welcome addition to the material already available on the market.

By accounting text book standards the book is unusually well written. The style is lively and readable, and the accounting procedures are clearly described, explained and amply illustrated. The reviewer has not had the opportunity to work out any of the problems, but a quick perusal indicates a reasonable gradation of difficulty from beginning to end of the book.

Conceptually, the scope and approach to the material is conventional. The 19 chapters cover the usual content of a first year syllabus: double entry bookkeeping, treatment of trading transactions, cash and its problems of control, payroll accounting, treatment of notes, adjustments, working papers, partnerships, limited companies, bonds, manufacturing and departmental accounts and statement analyses. The book, however, does not fully conform to the current trend. It does not include a chapter on the managerial facets of accounting—budgeting and costing.

What the book does include, nevertheless, is frequently handled in a refreshing way. In the chapter on notes and drafts, for example, the authors resist the temptation to be academic. They just allow enough space to notes to cover their practical aspects without unnecessary refinements. Similarly, in the chapter on partnerships and limited companies the presentation covers all that is pertinent but is pared to essentials.

The total impression from this book is that Professors Leonard and Beard are skillful and even, at times, stylish writers. Every instructor and student will find this book a desirable and instructive addition to his library.

Delegation of Authority and Responsibility . . .

By Bruce A. C. Hills, M.B.E., B.Sc., Eng.,
President, Urwick Currie & Co., Ltd.
Montreal, P.Q.

Effective management depends upon the judicious delegation of powers by a chief executive to his subordinate executives, while coordination and leadership of their efforts remain his primary tasks. This article is concerned with the extent and character of delegated duties.

IN DISCUSSING the delegation of authority and responsibility, one question must be disposed of immediately—"why is there any need to delegate?". There is one simple answer:—it is necessary to delegate in order to match capacity to load in carrying out the job of management. That is to say, delegation is necessary in order that the job of management can be spread over a sufficient number of people to ensure its full and proper performance. I would, however, like to develop this point more fully before discussing the process of delegation as such. In any organization, be it for the purpose of making refrigerators, retailing foodstuffs, or carrying out some service such as providing electricity or Government, the primary objective is the adequate performance of some work-job. Thus the primary objectives in the examples quoted are the designing, building and selling of refrigerators; the buying and selling of foodstuffs; the making and distributing of electricity; and creating and operating the various services of Government. Now, so long as these primary objectives could be achieved by one man there would be no need for management at all. Management arises only when the primary objectives are the concern of a number of people working together—when there is an organization. The reason is easy to see. All the people in the organization are working to achieve the same primary objective. And so that they should be able to do this it is necessary to plan their work for them, co-ordinate their various efforts, direct and control the jobs assigned to them, and so on. Thus the secondary objective is created—to manage and administer the organization so that it can achieve the primary objective.

I cannot help commenting here that from the attitude of certain executives I have met in a fairly long association with industry, one would conclude that *management* is the primary objective. The attitude is described by the rather unkind story of the managing director who said at a Board meeting "Gentlemen, we have had a very successful year. We have exceeded our budget figures in turnover and profit, and we can be proud of our products"—then added in an aside to a subordinate—"By the way, what products *are* we making?"

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*An address delivered before the Ottawa Chapter of the Society of Industrial and Cost Accountants of Ontario on Sept. 13, 1956.

Delegation—The Tool of Good Management

However, good management is clearly essential in order to achieve one's objective, and as an organization grows so does the extent of the management load. Delegation, as I have said, is the means of spreading this management load; the *effectiveness* with which the load is spread depends upon the degree and effectiveness of the delegation. You can go further and say that the whole economy of the organization—the extent to which the objective is achieved satisfactorily and *economically* —depends upon correct delegation. For you can streamline processes and procedures; you can improve the saleability of the product and provide for its development; you can introduce strict controls over expenditure on services, materials and labour;—you can do all these things, but you cannot reap the full benefit of any of them unless the management team is a smooth-working, virile and fully integrated organization—and *this* is not possible unless delegation is understood and employed to the fullest possible extent.

Now we are talking about the delegation of "*authority* and *responsibility*". By authority we mean "the right to require action of others" and responsibility has been described as "accountability for the performance of duties", i.e. the individual is held responsible for a proper performance of his duties. Here arises the first point. Authority and responsibility must always be associated—both must be delegated. For you cannot make a man responsible for the proper performance of his duties unless you give him the appropriate authority to require action of others; equally you cannot give a man authority without holding him responsible for the results of his use of that authority, otherwise there could be serious abuse of power. Both have to be delegated—that is, handed down from a superior to subordinates. And the extent of the spreading of the load depends upon three things:—

(a) How much an executive *can* delegate
(b) How much the superior executive is *prepared* to delegate, and
(c) How much delegation *can be accepted* by the subordinate executive in each grouping throughout the organization. Thus it comes back to a matter of calibre of executive—of personality, training and managerial experience.

Effective Organization Needs Leadership

Now we have talked about delegation *downwards*. But why not sideways? Why not split up the overall job of management between top executives at an equal level? Instead of a pyramid structure, why not a square one? This involves a controversial point which concerns industry very much today—who should head up an organization—a single chief executive or an executive team? Some authorities say that the management of a large-scale organization today is too big a job for one man; there must be a team of "chief executives" sharing the load. But let us look at this job of management and see what it comprises.

Lyndall Urwick has listed the components of management as Initiating, (arranging for change when and where needed); Interpreting, (the need for changes to all concerned so that they accept them as their own); Representing, (the company and its purposes); and Administering. The job at the top of the organization is summed up in the word *leadership* for "the main duty of any executive is to *lead* his unit". (1) Again, at the Torquay Conference sponsored by the European Council of the Comité Internationale de l'Organization Scientifique (C.I.O.S.), Mr. Urwick makes the point "A committee, for instance, cannot lead. Leadership is essentially a relationship between individuals, the leader and each member of the group he leads. On the part of the led it usually connotes enthusiasm for and loyalty to the purpose of the group as represented by the personality of the leader. But no man can feel loyalty to or enthusiasm for a committee, a heterogeneous collection of his fellow human beings. He will love and admire one member, love a second without admiring him, admire a third without loving him, and so on. His attitude to the committee as a whole will tend to be the lowest common factor of the emotions aroused by the individual members". (2)

I am quite certain, as the result of many years experience in industry, that this principle of individual leadership is a vital one. It conforms with the main principles of our Western Democracy, with the belief that no man gives his best effort to a completely nebulous and soul-less thing called the State; he must work for real live people, and each man is inspired and his efforts are given impetus to the maximum degree by individual leadership—it is the same in industry as in sport where teams are involved.

The United States President's Committee on Administrative Management states it without qualification—"the foundations of effective management, in public affairs, no less than in private, are well known . . . stated in simple terms, these canons of efficiency require the establishment of a responsible and effective Chief Executive as the centre of energy, direction and administrative management". (3) And even the exponents of "executive teams" at the top of the pyramid have to admit the need for *one* man to stand out as leader. Peter Drucker, for example, says "On the contrary, a captain is needed. And one man is almost certain to stand out as the *senior member* by virtue of his intellectual or moral authority. There was, for instance, never any doubt in General Motors that the head of the table was wherever Mr. Sloan sat, nor at

(1) "Profitably Using the General Staff Position in Business", by L. Urwick, General Management Series No. 165, American Management Association, New York.

(2) "The Load On Top Management—Can It Be Reduced?" by L. Urwick, published by Urwick, Orr & Partners Ltd., London, England.

(3) Report on the President's Committee on Administrative Management", US. Government Printing Office, Washington, D.C., 1937.

Sears, Roebuck that General Wood was a good deal more than the first among equals".[4]

I can start then with the assumption that the head of the organization must be one man as Chief Executive. There must be just one man at the top of the pyramid and the subsequent shape is then determined by the number of subordinates he can manage.

The Extent of Delegation

This leads to the next controversial point—how many executives *can* be grouped under one man? The number is limited by what is usually referred to as the *span of control;* some writers question the implications of the word "control" and Dr. H. H. Rice of General Electric has, I believe, used the phrase "the span of managerial responsibility" to describe the limiting factor. Whatever it is called, the span represents that number of subordinates which an executive can adequately advise, direct, control, discuss problems with, ask advice from, inspire, instruct and develop. As I have said, it depends primarily upon three major factors, and each has to do with delegation.

Delegation in the executive field can be defined as the committing or entrusting to a subordinate some definite portion or area of an executive's total duties or responsibilities in order to match executive capacity to load. The important word in this definition is *entrusting;* it correctly implies a placing of trust in the subordinate, so that the latter should look upon the responsibility of the delegated area as a stewardship. While he accepts the full responsibility in respect of the delegated area, he is still responsible to his superior for the effective performance of the relevant duties and responsibilities. For in delegating to subordinates no man frees himself of any of the responsibility of carrying out his own job according to the terms laid down for that job. The Chief Executive loses none of his responsibility for the overall efficiency of the organization, its overall performance against plans made for it, its adherence to the policies issued from time to time—he is still responsible for good selling, for the costs, quantities and quality of manufacture, for effective buying, and so on, even though responsibility for the actual handling of these jobs has been delegated to others. Similarly the executive in charge of a manufacturing unit, in delegating to departmental managers, loses none of his responsibility for the efficient running of those departments.

In order to extend the span of man-management as far as possible delegation must be complete and as full as possible relative to the delegated areas—to the extent that the subordinate is told to "run the show entirely on his own", to make his own decisions, to select his staff and to accept full responsibility for framing plans necessary to achieve the required objectives. But even under these conditions the superior,

(4) "The Practice of Management", by Peter F. Drucker, Harper & Bros., New York, p. 177.

because of his overall responsibility, must satisfy himself that the correct decisions have been made and that the action taken has in fact achieved the required objectives. For the objectives of each of the delegated areas are only part of the overall objectives.

And equally, in order that delegation can be as complete as possible, the subordinate must realize the responsibilities associated with the acceptance by him of delegation. This is particularly important relative to the stewardship nature of their jobs—the holding in trust of part of the overall job. There must be no question of any subordinate resenting "interference" in his particular area of responsibility—and yet I have met on many occasions departmental managers who have in different ways said of their superior "It is *my* job to run this plant (or department; or office), why can't he leave me alone to run it?" There can in fact be no complete independence in any part of the organizational structure.

Apart from an executive's *willingness* to delegate, the extent of delegation possible depends on the further two factors I referred to earlier in this article—*what* can be delegated and how much delegation can be accepted by his subordinates. First then, we should determine what can and what cannot be delegated. Two of the four functions—representation and initiation—need not affect to any extent the span of man-management. Representation in most cases can be effectively covered by the Chairman of the Company, or a non-executive Vice-President particularly suited for the job. Initiation is more often than not a matter of Board decisions; their implementation is closely linked with another function—interpretation. Interpretation of the company's present and future policies—"of the need for changes to all concerned so that they accept them as their own"—is an integral part of leadership which relative to the overall area of the Chief Executive's responsibilities cannot be delegated by him.

Areas of Responsibility

Administration requires a further break-down into its constituent parts—forecasting, planning, organizing, directing, co-ordinating and controlling. Omitting for the present the function of co-ordinating, each of the remainder can be delegated *relative to the delegated areas of responsibility*. This means in effect that while the overall responsibility for each of the functions cannot be delegated by the senior executive, he can be relieved of the administration (and therefore the *detail work*) associated with the delegated areas. It works this way:

1. Prior to the period covering the activities to be administered —let me call this the "administrative period"—the broad plans and objectives for the whole organization are formulated relative to that administrative period. The foundation of this work will be the future long-term policy as it relates to the period

under review; the finalizing of the objectives comes after each of the subordinates has carried out the necessary forecasting and planning relative to his own area of responsibility. Each subordinate translates the demands of the overall objectives into terms which relate to his own area—sales or production capacities or buying requirements, or indeed all three, depending on the nature of the area for which he is responsible; he assesses the possibilities and probabilities of achieving his own share of the overall objectives. Each subordinate is thus responsible for a part of the detail work involved in building up the latter. But this immediately demands *co-ordination* by the senior executive, for viewpoints will clash, and the separate forecasts and plans must be integrated so as to mesh with all the others.

2. Similarly, when the objectives have been established and issued, the necessary detail work of organizing and directing can be delegated relative to the delegated areas. But here again the work of the subordinates will impinge on each other and once again, although the detail work of the functions can be delegated, the *co-ordination* of the separate efforts cannot.
3. The final function of control can be delegated as regards detail but not as regards the overall picture. Thus the senior executive only wants to know that each of his subordinates is meeting the objectives set for their delegated areas, and that therefore the overall objectives will be attained; the subordinates can be responsible for controlling the relevant details of their own objectives to ensure their attainment.

Co-ordination

Thus it is clear that much of the detail work of each of the functions of administration can be delegated by the Chief Executive. In doing so, however, he is building up the extent of the co-ordinating effort required of him. Co-ordination of the work of his subordinates becomes in fact, with leadership, his main job in the organization. Clearly therefore the amount of co-ordination required determines to a very considerable degree the extent of the span of man-management. And the amount of co-ordination is greatest when the overall job is broken down into delegated areas on a *functional* basis—selling, manufacturing, buying, and so on—it is least when the delegated areas can be made as autonomous as possible—when they are in fact "overall" jobs themselves. This can be achieved by splitting the operation of the company on a geographical area, or product basis, each of the units being responsible for their own buying, manufacturing, selling, and so on.

The reason, of course, is that co-ordination of *functions* has to be to all intents and purposes a continuous process, even when objectives

are established for each. And the co-ordinator has to handle men with opposing viewpoints; the subordinate in charge of production wants the highest possible prices, the longest allowable delivery times and large stocks of materials to draw upon; the subordinate responsible for sales demands competitive prices, immediate delivery and ultra-quality; the financial man wants low production costs and high prices, and particularly inventories kept as low as possible. Each feels his own viewpoint is the important one; moreover each by the nature of his specialized training and experience finds it difficult to appreciate his colleagues' viewpoint; and specialization adds to the difficulties of co-ordination by creating a special language for each function.

On the other hand, co-ordination of areas delegated on a geographical or product basis is reduced to a minimum because of their relative autonomy. It is true that at some point a function split and co-ordination of functions has to be provided for. But the further down the organizational pyramid this co-ordination can be relegated the easier it becomes. For as the size of the operational unit reduces, so communication and teamwork is facilitated; the "family" atmosphere becomes more marked and co-ordination approaches an automatic action between colleagues working closely together.

Delegation of Decisions

Here then is an important condition which will reduce the amount of the management load and lead to the most economic management structure—the relegation of functional co-ordination to the lowest possible level. To be effective, however, delegation of responsibility in the levels above the functional split must be as full and complete as possible—each unit must approach autonomy to the maximum extent. And this brings me to the next important point. The degree of autonomy depends to a very large measure on the delegation of *decision-making.*

In each of the functions of administration decisions have to be made affecting the delegated areas of responsibility. In each case the responsible executive should have arrived at a conclusion as to the correct action to take having considered all the relevant facts and having co-ordinated the viewpoints of his subordinates; if he has then to refer to his own superior for a decision the advantages of delegation relative to the spread of load and increase of the span of man-management are materially reduced. For unless he is to make a snap decision without proper consideration of all the facts and figures—or equally as bad, merely "rubber stamp" the decision presented to him—the superior will himself have to go through the whole business of sifting facts and viewpoints before he can make up his mind—he might just as well have direct contact with his subordinate's subordinates.

I recently saw an analysis of decision-making by Ernest Dale, of New York, which I think can be adapted very usefully to clarify the point.[5] His grouping is as follows:

1. Delegation of routine decisions that a manager is expected to make without reporting that they have been made. These are repetitive decisions *required for the execution of his job,* and they are usually covered by written company policies or procedures.

2. Delegation of decisions that do not need to be reported until they have been carried out, e.g., the decision to hire and fire personnel, to buy equipment and approve expenditure covered in the departmental budget.

3. Delegation of decisions which affect or might affect other executives or other parts of the company; they include decisions on obviously major matters like adopting a new product or sales technique.

Provided that the responsible executive is competent there should be no difficulty in full delegation in respect of the first two groups. It is still important, however, that his superior checks that the right decisions have been made, but this usually is done on the exception principle, i.e., it becomes evident when a *bad* decision has been made because of its effect on achievement of objectives or the healthy atmosphere of his subordinate's department—and, of course, most bad decisions are very quickly reflected in the relevant control data.

The third group is more difficult but still possible of delegation to a large measure. The subordinate can find out the reactions of the other executives involved; he will by constant testing of similar decisions be "au fait" with the company policy and his Chief's interpretation of that policy; he will have many opportunities through informal meetings of sensing the probable reactions of his Chief during the building-up of his decisions. In very many cases, therefore, even in the case of this third group the *good* executive can arrive at his own decision and implement it after the briefest reference to his Chief—particularly since if he *is* a good executive his Chief will know through experience that the decision is likely to be the correct one. Providing therefore that his subordinates are of the right calibre, the wise Chief Executive will work on the principle of giving them the widest possible latitude in the matter of decision-making, relying on the slightly "off-beam" decisions (and they will only be slightly off-beam if the subordinate is of the right calibre) to continue the process of guiding the individual subordinate in interpreting company policy and in perfecting co-ordination with his colleagues.

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(5) "The Subtleties of Delegation", by Perrin Stryker, Fortune Magazine, March 1955.

Calibre of Executives

This relegation of functional co-ordination to the lower levels and its replacement in the upper levels by co-ordination of product or area divisions with their greater degree of autonomy at once raises the question of calibre of executives. For the upper ranks no longer can consist of functional specialists; they must be replaced by *general managers*—replicas of the Chief Executive, with the wider experience and broader vision, the absence of functional bias and possession of more general knowledge that general managership demands.

And there we come to the crux of the matter. The degree of delegation by the Chief Executive depends (a) on his own ability and willingness to delegate, and (b) on the calibre of his subordinates and their fitness to accept delegation. Both are important. There are many top executives today who still love to dabble in detail, who will not trust efficient subordinates, who will not leave well alone but who must take a hand in the game beyond the terms of their overall responsibility. But equally there are subordinate executives who cannot be trusted to make the correct decisions; some even who cannot carry out their administrative functions without constant correction and guidance from their superior; many who cannot co-operate with their colleagues on the same level. Such men in both categories reduce the span of man-management and prevent the achievement of maximum delegation and minimum organization structure. Above all, therefore, the shape of the organization pyramid depends upon the calibre of the executives in the organization.

Conclusion

That, surely, spotlights the problem. So much of Canada's future depends upon an adequate supply of good executives and as Canada grows the more vital and urgent does this need become. On the other hand, executives of the right calibre reduce the total number of managers required for the working population by making possible the wider spans of man-management; they ensure the smaller, more effective and smooth-acting management team which spells the difference between success and failure; they provide the "power-drive" *throughout* the organization instead of at the top only, which will keep us ahead of our competitors. There can be no question, therefore, that concentration of effort today should be directed towards improving the calibre of present and future executives—towards devising better ways of selecting and training managers, of developing potential material in the lower management ranks—towards using the many high-calibre executives in industry to the best advantage, to the fullest extent of their managerial abilities. We must learn to delegate and be fitted to take delegation—both to the fullest extent possible.

I cannot do better than to end this paper with the words of Andrew Carnegie—"You may take away my steel mills and furnaces, deprive me of my capital, but leave me with my organization and in five years time I'll be back in business, as powerful as ever". The objective of Canadian industry must be for each top executive to be able to say the same words relative to his own management team.

FOR FURTHER READING

THE MAINSPRING OF BUSINESS LEADERSHIP, by Paul Cifrino, Harvard Business Review, Sept.-Oct. 1956.

THE ORGANIZATIONAL ANALYSIS, by H. J. Neufeld, Cost and Management, June 1956.

RESPONSIBILITY CHARTING—A METHODS TOOL, by J. D. Liptak, N.A.C.A. Bulletin, May 1956.

MANAGEMENT IN ACTION, by Lawrence A. Appley, American Management Association, New York, 1956.

NEW ELECTRONIC TYPEWRITER INTRODUCED BY IBM

International Business Machines Company Limited has recently announced the "reading" typewriter introducing, for the first time in history, electronic principles in typewriter tabulation. In Canada, the IBM Electric Typewriter is manufactured at the Toronto factory of International Business Machines Company Limited.

The new typewriter specializes in the "reading" of prepared business forms which contain blank fill-in areas for the entry of date, order number, address, terms, and similar data. The electronic "reading" feature of the new IBM typewriter eliminates time consuming tabulating adjustments no matter how many different types of forms are placed in the machine.

Here is how the new device works. Vertical lines printed on the business form with electrically conductive ink, make the form sensitive to electrical impulses. These conductive lines, in effect, programme the typewriter. When the tab key on the keyboard is depressed, a tiny sensing unit close to the paper "reads" the form and automatically positions the typewriter carriage at the correct typing point.

The electronic tabulation typewriter may be used for any normal typing application. Only a few minutes instruction is necessary to operate the machine. The "reading" unit is made operative by depressing the "electronic tab" lever on the front of the machine. If nonsensitized forms must be used, a flick of the same lever returns the machine to the conventional manual tab setting condition.

The electronic unit is mounted beneath the keyboard and is confined to a small metal container within the case, approximately three by six inches in size.

Forecasting the Cash Balance . . .

By WILLIAM M. FISCHER
The Ryan Aeronautical Co., San Diego, California.

The advantages of planning for cash control are obvious. This article outlines the factors that enter into cash forecasting from the analysis of collections to the disbursement of cash emphasizing the need for regular and constant application of forecasting techniques.

COST accountants and financial managers will agree that the cash position of their company is, in part, indicative of its strength—of its ability to operate on a sound financial basis. Without doubt every firm has one or more individuals who must of necessity plan for and control the operating cash on hand. Those who do so effectively are saving money—substantial amounts—where interest is computed at current rates of 4 to 5%.

Since World War II a great deal of emphasis has been placed on various facets of managerial control including cost reduction programming, overhead and departmental budgeting, production planning and sales forecasting. Little has been written, however, on methods and techniques available to forecast cash. This is so, perhaps, because in large corporate structures, the work is highly routinized and based on automatic accumulation of data on a daily basis. In many companies, however, equipment necessary to generate such daily information is not economical and a great deal of manual analysis is necessary to adequately control the cash on hand.

It is the purpose of this article, then, to describe a number of considerations, stop signs, of which one must be cognizant in planning for cash control. Perhaps the first of these would be the purpose of the cash plan or forecast. Just how valuable is the forecast? What can be gained from a seemingly simple analysis of the cash flow? The answers, though obvious in many cases, are often forgotten. A company must know how much cash will be on hand to meet the day-to-day operating expenses as well as to pay for extraordinary costs, such as capital items, taxes, and dividends, to mention a few. It should know, further, when the cash balance is uneconomically large, or when it will be short of requirements. With this knowledge at hand, it can either borrow wisely —not for the short run, but on a planned long terms basis, or the idle, surplus cash can be put to work. This, then, is the reward for effort —keeping the asset at a point of greatest return, daily, monthly, and throughout the year. With this goal in mind the accountant can proceed to analyze why the cash behaves as it does and learn where to erect guide posts to help in maintaining the proper balance.

With little trouble cash receipts can be segregated from disbursements and each treated separately. And from this point forward there is one basic thought which must be paramount in every consideration. While cash is a general ledger account, its behaviour cannot be predi-

*This article is published through the courtesy of the National Association of Cost Accountants, New York, N.Y.

cated on general ledger income and expense history where there exists an accrual system of any description. Cash can accumulate and be disposed of in either greater or less quantities than that which is entered in expense, income, asset or liability accounts. It will, of course, in the long run be a partial result of operational income and cost, but day to day and month to month, it can travel its own freeway far and apart from ledger influences. In addition to developing historical cash habits based on data not directly associated with the general ledger, a forecast of sales and direct labour costs must be available before the cash balance for tomorrow or next month can be successfully prognosticated. The development of these all-important forecasts is another subject, however, and for purposes of this discussion it will be assumed that they are available. It might be well to mention at this juncture, that the considerations following will be applicable to medium sized industrial firms for the most part and that, while some of the techniques discussed have universal application, financial and marketing organizations will encounter problems not touched upon herein.

Analyzing Cash Receipts

It will be found that for the short run forecast, two weeks to a month, perhaps, an analysis of each customer's paying habits will be helpful, if not essential. Historical data reflecting the average number of days each invoice is outstanding should be accumulated and kept up to date. When discounts are offered, the analysis becomes more complex. It is usually possible, however, to average out discounted receipts with those not discounted to arrive at a norm for each customer. Thus, in the short run, one can analyze the receivable ledgers and determine what should come in within the next two weeks, say. Trends within months can also be developed. This is particularly noticeable in discounted sales where the first 10 days receipts will tend to be heavy. It is further possible to determine when specific cheques can be expected each weekly or monthly period through detailed study of a customer's paying method. Exhibit I shows a simple analysis of receipts due in during a two week period based on historical experience of each customer's account.

EXHIBIT I

CASH COLLECTIONS OF RECEIVABLES
JANUARY 2 - JANUARY 15, 1956

Customer	No. of days items outstanding	Cut Off Date (A)	Total of current items older than (A)	Past Due Items	Total Due in by Jan. 15th
A	19	Dec. 26	57,200		57,200
B	24	Dec. 21	13,100	* 37,000	50,100
C	15	Jan. 1	120,000		120,000
D	18	Dec. 27	32,000	**29,000	61,000
E	32	Dec. 13	16,000		16,000
F	27	Dec. 18	39,500		39,500
Total Cash Receivable					343,800

*Tooling Invoice awaiting first article approval—due in by January 10th.
**Target Invoice dated 11/30. Priced in error, corrected and reinvoiced 12/22—due January 10th.

Once the forecast goes beyond the normal collection cycle of 30 days, or whatever it may be, a new technique to predict further in the future is necessary. Armed with a good sales forecast, the accountant can delve into the long term forecast of cash receipts. After adjusting the sales forecast for any accrual type entries and an analysis of the usual miscellaneous sales activity, he can use sales figures to predict billings and collections. The average percent of sales collected monthly by product line and/or customer can be used to advantage in this regard. A great deal of testing and analysis can be performed in this area to determine which index proves the most accurate. Where a number of products are sold to several customers, it will be found more accurate to analyze each product line and arrive at an average rate of sales collected in the first month, second month, and so on. Once a pattern is developed for each line, the sales forecast can be used to spread the receipts into the proper month. Extraneous sales of scrap and surpluses must be checked out as well and a formula developed to associate collections thereof with normal sales. Not to be overlooked are collections from outside collection agents, vending machines, employees' loan payments, and, in the case of defense contracts, termination claims payments. Historical averages will normally suffice to predict such collections, except for termination claims which must be treated on an individual basis.

Since collections of cash sales are confined for the most part to retailing and constitute a substantial portion thereof, discussion of these collections will be omitted. Payments due on notes receivable are, of course, more easily predicted and can be scheduled based on an analysis of the subsidiary ledgers taking into account the type of note and the character of the debtor.

It should be borne in mind that the analysis of receivables and sales is a continual process and that, save for a static type of sales market, an analysis made once or twice a year will not normally suffice to accurately determine when cash collections will occur.

Predicting Cash Disbursements

Compared with an analysis of collections, the disbursement of cash presents something more of a problem since the method of disbursement and types of payment are highly diversified and predicated on many more factors than the simple sales or receivable concepts.

Raw Material and Subcontracted Work

Perhaps the most difficult disbursement to predict is that for raw material and subcontracted work. The greater variety of material, diversity of product and variance in manufacturing cycle, the more involved becomes the problem of developing a base upon which to predict material payment. For purposes of illustration, let us take the problem present in a company selling 50 different manufactured

parts, each of which may contain two to three types of material and many of which have varying manufacturing cycles with irregular quantities due out each week. It is at once apparent that to accurately determine the cash requirement, a company must have a good sales forecast, a complete bill of material extended at market costs, accurate manufacturing cycle data and the lead-in time for mill or warehouse delivery. If the firm is fortunate enough to have this information readily available, the task of correlating it and summarizing the data to show when all materials must be received and subsequently paid for is no mean task. It is the author's experience that unless such work is done automatically, on tabulating equipment, the manual job of scientifically predicting cash requirements for raw materials and subcontract work is an uneconomical operation in a company operating under the conditions outlined above. Starting with a tabulated bill of material for each part, however, a cash requirement figure can be developed that will be reasonably inexpensive to acquire and sufficiently accurate for forecast purposes. Close coordination with the procurement and material control departments is essential in securing the data in any case.

Another technique may be applied in forecasting raw material and subcontract disbursements in those firms which develop and maintain a running record of all outstanding commitments based on unfilled purchase orders. Such a record can be used where a current schedule of delivery dates and dollar amounts are recorded and grouped chronologically (usually on tabulating equipment). The orders must further be coded as to type of material being purchased so that the raw material, or other items being scheduled, can be segregated. Assuming a good coded run and regular delivery dates without a preponderance of past due items, the report can be used to advantage as long as discounted payments do not distort the normal payment lag. There are, however, a number of variable factors to contend with and any such report should be thoroughly analyzed before any reliance can be placed upon it.

The build-up of inventory in work, in finished goods and in raw material is, of course, an activity that must be forecast as well. It is, in fact, one of the most influential factors affecting cash balances. The acceptance of new orders requiring additional tooling and engineering and a stocking of finished goods for various reasons will give rise to a depletion of cash which must be accurately forecast if a company is to finance the build-up wisely.

A closer analysis of this condition leads us, logically, to consideration of direct and indirect labour costs. Payroll forecasting presents less of a problem than does the material disbursement forecast since we deal only with two elements of cost which can be directly associated to sales and inventory build-up or depletion. In many plants it will be found that the following relationships are constant enough to use in predicting direct and indirect labour costs.

a. Average rate per hour for direct labour.
b. Ratio of direct labour cost to total labour cost.
c. Ratio of salary pay to total labour costs.
d. Ratio of indirect to direct salary pay (or same breakdown of hourly pay).

Through relatively simple manipulation of these historical averages we can predict the gross cash payroll each week assuming of course that a budget or schedule of direct labour hours is at hand. (See Exhibit II). While the development of a direct labour hour budget is a prerequisite for the cash forecast, its preparation is a subject in itself and will not be treated herein. Suffice it to say that direct labour hours dictate not only cash requirements but many other areas of costing, for burden particularly, and as such, deserve a good deal of attention in planning for future financial control. To arrive at the cash requirements for the weekly payroll it is necessary only to take the direct labour hours and apply the ratios above in logical sequence, as shown, to arrive at the labour cost for each period. The figure must then be adjusted to a "pay-day" basis, for the hourly payroll, i.e. because a month contains 23 working days is no indication that the payroll will reimburse workers for 23 days. The adjustment consists of moving the hourly labour cost into the proper pay periods—on a weekly basis it will convert to 20 or 25 days or the equivalent hours depending upon the number of pay-days. While this may appear to be an extremely elementary consideration, it is often difficult for the analyst to keep in mind when running through the many detailed calculations necessary to achieve a true payroll forecast. Another pitfall to avoid is the averaging of labour hours and costs in attempting to account for an irregular number of pay-days each month or week.

Once the direct payroll is prepared, the indirect payroll can be added to it as shown in Exhibit II. Care must be taken to segregate salary and hourly pay since the salary pay is normally not as variable each month as is the hourly and not dependent on hours worked. Overtime pay can most easily be accounted for by averaging it with the regular straight time rate per hour.

EXHIBIT II

PAYROLL ANALYSIS FOR ONE MONTH

Known Factors

A.	Direct Labour Hours for Month		100,000
B.	Average Direct Labour Rate Per Hour		$ 2.10
C.	Ratio of Direct Payroll to Total Payroll		55%
D.	Composition of Salary Payroll	31% Direct	
		69% Indirect	
		100% Total	
E.	Percent of Salary Payroll to Total		32%

Computed Factors

F.	Direct Payroll (A x B)	$210,000.00
G.	Gross Payroll (F ÷ C)	381,818.00
H.	Indirect Payroll (G — F)	171,818.00
I.	Gross Salary Payroll (G x E)	122,182.00
J.	Salary Direct Payroll (I x D, Direct)	37,876.00
K.	Salary Indirect Payroll (I — J)	84,306.00

Recap

	Direct P/R	Indirect P/R	Total
Salary	$ 37,876.00	$ 84,306.00	$122,182.00
*Hourly	172,124.00	87,512.00	259,636.00
Total	$210,000.00	$171,818.00	$381,818.00

*All hourly figures forced. Knowing hourly figures, all salary figures could be forced.

The gross payroll so developed then becomes the base for computation of payroll deductions and the disbursement of such deductions to various governmental agencies, insurance companies, banks, etc. A complete discussion of the many types of deductions and manners of disbursement cannot be encompassed herein due to the complexity of systems and variations in company policies. It is not an area to be treated lightly, however, and requires a good deal of analysis. In general, each deduction can be expressed as a percent of gross payroll, and is normally disbursed in the month following the deduction. The fact that Old Age Benefit and similar taxes are applicable only to a portion of wages earned during the year causes the percentage of payroll figures to decrease over the year and a good deal of historical data is necessary to accurately forecast this type of deduction. Here again, general ledger entries are of little value and data must be secured from made to compute overall payroll costs.

Payment of such taxes may be made in quarterly or annual installments and must be so forecast. Once the analysis of each deduction and its time of disbursement is determined, there is little further work required to compute the net cash requirements for each payroll.

No mention has been made of research and development labour since it is assumed that such activity will be treated as direct labour. Should it be segregated, a separate analysis of hours therein must be other sources such as payroll runs.

The next type of disbursement requiring attention is that heterogeneous category of overhead or burden (aside from indirect labour). While this type of cost contains many different classes of expense, it will be found, in many companies, that the rate of cash disbursement for these items is a reasonably steady factor. Although separate analyses of cash requirements for factory supplies, perishable tools, power and office supplies, to mention a few accounts, will tend to refine the

disbursement rate, it will be found that an overall grouping of such routine expenses can be related to sales or direct labour hours successfully. Over a period of a year or two these items will normally follow a recognizable pattern and can be forecast as such. Further, since the forecast has included indirect labour as a payroll item, the proportion of cost left in the remaining overhead accounts is relatively small so that rather wide variance in month to month cash disbursements can be tolerated. It should be pointed out that this "broad-brush" treatment can be applied successfully only to expenditures of a routine nature. Such items as property and franchise taxes, extraordinary maintenance costs, advertising, and heat deserve special attention and must be segregated from recurring overhead costs. A simple analysis of the chart of accounts will reveal these items quickly.

The balance of our expenses of an irregular nature must each be treated separately. Taxes, as computed on profits, will be disbursed as the current law requires, interest as the notes and line of credit agreements dictate, and dividends as the company policy requires. One of the more difficult classes of cash disbursement is that for capital items. Forecasting such outlays should be predicated upon a capital budget. Close liaison should be maintained with the plant engineering division or its equivalent in ascertaining time for progress payments on construction, dates of delivery and installation expenses required on machinery and the rate of replacement being followed. Acquisition of office machinery should be scheduled as well and coordinated with buyers concerned.

Other items requiring consideration are payments made to retirement or profit sharing plans, donation funds and extraordinary rentals of machinery and electronic equipment.

Little has been said of a daily cash report and its advantages since such data is assumed to be a necessity in a current analysis of the cash position. In brief, the report should show receipts by product and/or customer and disbursements by major category as well as bank balances and receivables and payable balances. The need for detail in such a report is predicated to a great extent upon day-to-day fluctuations in receipts (such as in retailing) and variations in disbursements caused by such factors as advantageous discounted payments.

With the cash forecast published for management's use on a monthly or quarterly basis, the problem of control of the cash becomes evident. (See Exhibit III). Perhaps one of the most obvious conditions to be observed is that of comparison of receipts with sales. The forecast will quickly point up those customers or product lines which, through delinquency in paying habits, are costing the company money in unnecessarily large receivable balances. While this is, of course, available to the chief accountant from other sources, it is far more forceful when presented as a cause of low cash balances. The forecast further aids

management to make accurate decisions on when it can afford capital investment i.e. the specific period when cash can be expended in this manner, and above all, it indicates when the cash balance must be increased. The period of time during which the cash will be inadequate is often an indication of what type of resources must be tapped to replenish the cash. For example, during a temporary period of low cash, such as during the tax payment months, temporary borrowings on a line of credit may tide the firm over. Should the forecast reflect a year or more of intense inventory build-up or loss of sales and subsequent lack of cash, acquisitions of additional cash for longer periods may be indicated. Mortgaging of real property, sales of unissued stock or sale of portions of an investment portfolio would possibly be advisable. In any event, the more accurate the forecast, the more wisely will management be able to plan its financial programme.

A technique sometimes employed to assist management, and the analyst, to more accurately judge the future cash position, particularly in the shorter periods, is that of showing, on the forecast itself, a range of probable cash balances each period. In order to overcome any bias which may be present in the analyst's mind, he can show what he feels to be a maximum receivable figure and minimum disbursement figure and just below the resulting balance, show the opposite, i.e., minimum receipts and maximum expenditures. In this manner, decisions can be made which will take cognizance of the many areas in the forecast which cannot be predicted with absolute accuracy. Ranges so developed should not exceed 10% or the forecast will lose its value.

Another factor requiring careful consideration is in the setting of minimum balances beyond which it is not safe or practical to let the cash fall. One of the most significant factors is that of diversity of receivables. The company which sells the bulk of its product to one or two major customers or is producing a highly specialized product subject to sudden obsolescence must of necessity maintain a relatively liquid position. Firms having highly diversified markets can, on the other hand, operate with considerably less cash since the risk of sales interruption is far less. Other factors of consequence are the size of the payroll, payments of taxes and dividends and outlays for material shipments which regularly require large amounts of cash. Many companies safely follow a rule of thumb that two weeks' operating expenses represent a minimum cash balance under normal circumstances. While there are many academic accounting ratios which may be employed to determine adequacy of cash, the individual needs and company policies are all important in arriving at an economical and safe cash position.

EXHIBIT III—CASH FORECAST—SIX MONTHS ENDING APRIL 30, 1956

	Nov. 1955	Dec. 1955	Jan. 1956	Feb. 1956	March 1956	Apr. 1956
Beginning Cash Balance	$175,600	$144,900	$108,700	$ 71,100	$ 75,000	$ 69,400
Cash Receipts (By Product)						
Jet Engine Parts	56,000	53,000	50,000	75,000	71,000	90,000
Govt. CPFF Contracts	3,000	7,000	5,000	5,000	5,000	9,000
Manifold Assemblies	107,000	100,000	118,000	120,000	110,000	140,000
Airframes	120,000	110,000	130,000	135,000	175,000	195,000
Rockets	32,000	35,000	30,000	33,000	39,000	45,000
Target Drones	12,000	13,000	13,000	13,000	14,000	20,000
Misc.	2,000	2,000	2,000	2,000	2,000	2,000
Total	332,000	320,000	348,000	383,000	416,000	501,000
*Bank Loan Proceeds			100,000			
Total Cash Available	507,600	464,900	556,700	454,100	491,000	570,400
Cash Disbursements						
Payrolls: Direct	111,000	106,000	116,000	117,000	123,000	123,000
Indirect	78,000	76,000	82,000	90,000	94,000	95,000
Total	189,000	182,000	198,000	207,000	217,000	218,000
Less Payroll Deductions	40,000	38,000	42,000	46,000	48,000	48,000
Net Payroll	149,000	144,000	156,000	161,000	169,000	170,000
Raw Materials	97,000	93,000	101,000	107,000	123,000	105,000
Subcontracted Prod.	9,000	9,000	10,000	11,000	12,000	12,000
Total	106,000	102,000	111,000	118,000	135,000	117,000
Overhead Items	40,000	38,000	42,000	40,000	41,000	42,000
Payroll Taxes	1,600	1,600	44,000	4,000	4,000	20,000
Payroll Ded. Disbursed	39,000	41,000	39,000	44,000	48,000	48,000
Income and Franchise Taxes			92,000			98,000
Property Taxes	20,000					
Capital Additions	4,000	1,000		9,000	18,000	
Interest	1,500			1,500		
Dividends		7,000			5,000	
Retirement Fund		20,000				
Donation Fund	1,000	1,000	1,000	1,000	1,000	1,000
Misc.	600	600	600	600	600	600
Total Disbursements	362,700	356,200	485,600	379,100	421,600	496,600
Ending Cash Balance	$144,900	$108,700	$ 71,100	$ 75,000	$ 69,400	$ 73,800

*Indicated Borrowing

Conclusion

The foregoing has set forth, in brief, the elements contained in a cash forecast and has placed emphasis on those areas requiring thorough analysis. While no attempt has been made to detail the steps required in arriving at ultimate cash receipt and disbursement figures, it is hoped that a guide is established for consideration of salient factors and that conclusions may be more easily reached through the analyses outlined. It may be well to reiterate that constant and consistent application of the techniques outlined is essential if any real use is to be made of the forecast. Where it is treated as a sideline job and performed by one whose interests are not compatible with the task, the result will frequently do more harm than good. Almost daily cognizance of receipts and expenditures is necessary if the cash is to be maintained at the optimum level. When such day-to-day observance of the balance and its causes is practiced, the actual preparation of a formal forecast becomes relatively simple and produces an effective medium on which to base accurate decisions.

FOR FURTHER READING

BREAK-EVEN ANALYSIS FOR CASH FORECASTING, by J. G. Ashbourne, The Controller, Dec. 1955.

A CASH FORECASTING PROCEDURE FOR SMALLER COMPANIES, by O. F. Brunner, N.A.C.A. Bulletin, Feb. 1950.

OBITUARY

With deepest regret the Society announces the deaths of Mr. and Mrs. Roland Wood who were killed in an automobile accident near Edmonton on September 8th. Mr. Wood, a former General member of the Edmonton Chapter, took a prominent part in Chapter activities, being a past chairman of the Chapter and a member of the executive for some years. He was Comptroller for Alberta Government Telephones.

Semi-Automatic Branch Inventory Replenishment . . .

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Keeping inventories at a safe level in a decentralized organization while providing for branch sales presents an involved problem. In the following article the author describes the successful application of a semi-automatic punched card system to this problem.

THE ANSCO Division of General Aniline & Film Corporation manufactures and sells a full line of photographic products including film, paper, chemicals and cameras. All manufacturing activities are concentrated in one location in New York State. Distribution of our products throughout the United States and Canada is accomplished by half a dozen strategically located warehouses which are also the center of the sales organization in each region. Each warehouse generally carries from nine to eleven hundred different products in stock representing only those items which have a large enough sales volume in that area to warrant the maintenance of an inventory. Most of our sales volume moves out to the customer from these branch stocks, the rest being shipped from the central warehouse. The accounting function is concentrated at the center of manufacturing and is largely mechanized on IBM equipment. Each branch warehouse invoices customers directly by writing a combination shipping order—invoice on IBM "CARDATYPE" machines. The above background information is supplied to acquaint the reader with the framework within which our method of replenishment operates. Any system must obviously be fitted to the organization and objectives of the company which uses it. The system which is explained in the following paragraphs can therefore only be viewed as one of several possible solutions to the problem of replenishing branch stocks.

Objectives

The main objective of a decentralized organization for national distribution of a company's products is to have the right product in the right place at the right time in order to effect a sale. The problem then is to find the most economical balance between inventory and sales at each distribution point. A fast method of replenishing stock at the distribution centers will make it possible to keep inventories at a minimum while furnishing adequate service to customers. Great strides in speeding up the shipment of merchandise have been made by the railroads and other carriers over the past decades and will continue to be made in the future. Over the short range, however, time in transit can not normally be reduced without incurring uneconomical costs. Speed in replenishing stock in district warehouses thus becomes a

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matter of faster communications and reduced paperwork. When dealing with a product of perishable nature (i.e. dated film), consideration must also be given to local factors which bring about short term changes in demand. In our company it was felt that branch personnel are closest to the day-to-day business and their knowledge of demand factors should therefore be fully utilized. The branch staff can usually foresee that on a particular item sales are steady, increasing or slowing and can temper replenishment accordingly. In addition to the above it was considered desirable to ship, whenever possible, in standard container quantities in order to reduce the handling of merchandise to a minimum.

The ultimate answer to the communications problem involved would be the transmission by wire of up-to-date information to the central warehouse or plant. Fully automatic replenishment would be possible, if sales, returns and other transactions affecting each branch inventory were transmitted daily to the central point, where they would be translated into replenishment requirements. For various reasons fully automatic replenishment was not considered economical in our case. We therefore devised what may be called a "semi-automatic" replenishment system. Our objectives were to combine speed with better utilization of existing IBM equipment while at the same time making use of local knowledge of changes in demand.

Establishing Stock Levels

A prerequisite for automatic replenishment of branch stock is the determination of a proper stock level for each product carried in the branch inventory. As a first step an average inventory period must be determined for each branch. For purposes of this discussion let it suffice to say that this inventory period is related to the time elapsed between determining what stock is required and receipt of the merchandise in the branch warehouse. In our case management decided on a 45-day inventory in branches within a 700 mile radius from the plant, a 60-day inventory within a 1,000 mile radius and a 75-day inventory in the South West and on the West Coast. Since one of the purposes of inventory control is to reduce the company's funds which are tied up in inventories it becomes obvious that as transportation and processing time are improved, inventories should be reduced correspondingly. The second step is an examination of seasonal fluctuations in sales. Such a study will indicate whether a single stock level for the year is adequate or whether two or more stock levels are necessary due to seasonal changes in demand. In our business the year can be divided into three seasons of four months. Each product therefore requires a separate stock level for each season. Finally the stock level for a product during a particular season is calculated as follows. If a branch operates with a 45-day inventory and has sold 600 units of product A for six months, a stock level of 150 units should be adequate (180 days ÷ 45 days=4; 600

units ÷ 4=150 units). There are other factors that influence the establishment of a stock level which we have not mentioned because of the limited scope of this paper.

Scheduling Shipments

In relation to the establishment of stock levels consideration must be given to the frequency and size of replenishment shipments to each branch. Since it is more economical to ship in carload or truckload lots, the frequency of shipments to a branch depends on the volume of sales in that branch. For example rather than shipping to a branch in less than carload lots each week it is desirable to ship a full carload every two weeks. In order not to overload the central warehouse staff at any one time the preparation of replenishment shipments to all branches must be appropriately timed. As a result of these considerations a shipping schedule is worked out each year for each of the branches. Based on the shipping schedule the paperwork required in the branches prior to replenishment is also scheduled to insure that each replenishment cycle is completed within a minimum of time.

THE SYSTEM

Preparation of Punched Cards

A master deck of punched cards is created for each branch and each season. A card is keypunched for each stocked item and interpreted to show the catalogue number, nomenclature, standard container and stock level. A branch identification may also be punched into the card at this time. The master deck for each branch and season is kept current in the central Tabulating Department. Any changes in stock levels, products, etc. for a district are processed into this master deck. On scheduled dates before each replenishment cycle a deck of replenishment cards is reproduced from the master deck and interpreted. The deck of replenishment cards is then forwarded to the branch for processing on a scheduled date. The deck usually accompanies the previous shipment of merchandise to the branch to save mailing costs.

Posting of Branch Requirements

Each branch keeps an up-to-date "KARDEX" on receipts and shipments of merchandise and any backorders. Advance copies of plant to branch shipping documents are filed separately and represent goods in transit until the shipment is received in the branch warehouse. On the scheduled ordering date the Kardex is brought up to date by posting any last-minute customer orders received in the branch. A clerk then posts the inventory quantity and any backorders from the Kardex to the corresponding field on the punched card. A similar posting is made for any goods in transit. The branch office manager may note on the cards any special facts, that he wants considered, and the replenishment deck is mailed the same day for processing at the central office.

Calculation of the Shipment

In the central Tabulating Department the figures on Kardex quantity, backorder and in transit are key punched into each card. This can be done rapidly because only 8 or 10 digits of information are involved. If inventory levels are properly controlled, only a few cards in a deck will indicate a backorder situation. Also, if shipping schedules are adhered to, only cards from the most distant warehouses will show an in-transit quantity. The IBM Calculator then mechanically compares the inventory with the stock level. The calculation is accomplished in the following manner: inventory level + customer backorder — Kardex quantity — in-transit quality = the required replenishment quantity. One of four results is then automatically punched into each card:

(1) If the calculated quantity is equal to the inventory level, zero is punched into the card indicating that no shipment is needed.

(2) In case of overstock, an "X" is punched in a control column in addition to the over level quantity. When interpreted the over level quantity is shown as a credit figure.

If the calculated quantity is below the inventory level, it is mechanically compared with the standard container quantity on the card and either one of the following results is punched:

(3) If the calculated quantity is divisible by the standard container quantity or is 80% or more of a standard container, the quantity to ship is rounded off to full standard container quantities.

(4) If the calculated quantity is less than 80% of one standard container, the exact amount to restore to stock level is punched.

The month and shipment number are then gang punched into the replenishment deck and the cards are processed through the IBM Interpreter to print the results of the calculations.

Allocation and Shipment

Cards that require no shipment are sorted out of the deck. Each remaining card is checked against the Kardex of central stock and quantities to be shipped are allocated. Normally the full replenishment quantity can be allocated, in which case a checkmark on the card is all that is necessary. When only a partial quantity is available for shipment, the printed quantity is crossed out and a new quantity is inserted manually. The deck of allocated cards then moves to an IBM Cardatype machine for preparation of the shipping document. The same cards are fed into the Cardatype, which automatically prints the catalogue number and nomenclature. The quantities are manually keyed in by the operator. As a by-product of this operation a punched tape is created showing the actual shipping quantities by product and branch. The complete replenishment deck and tape is returned to the

central Tabulating Department for use in preparing inventory transfers and various reports, which are discussed below. An advance copy of the shipping document is immediately forwarded to the respective branch. Several copies are sent to the warehouse where merchandise is picked and shipment is made on the scheduled date. A copy of the shipping document accompanies the shipment as a packing list. Copies are also sent to the central Kardex and the Tabulating Department in case any changes in the calculated shipping quantities are made at the warehouse.

Tabulating Reports

After the shipping documents have been written the replenishment deck is used to prepare reports on the overstock and backorder situation in each branch. These reports are available for scrutiny within one or two workdays after receipt of the replenishment deck from the branch and thus present an up-to-date picture of exceptional stock levels. The overstock report is obtained simply by sorting out the overstock cards from the replenishment deck and listing them on an IBM Accounting Machine. For the backorder report all cards with a backorder quantity are sorted out of the replenishment deck and required information is reproduced. In order to obtain the backorder status after shipment the following calculation is made: Kardex quantity + in transit quantity + replenishment quantity — backorder quantity = backorder quantity after replenishment. The reproduced and calculated cards are then listed in report form. Both reports are reviewed by various departments and serve as a tool in scheduling production and transfering inventories between branches.

Inventory Transfers

The replenishment system also provides us with a means of translating replenishment shipments mechanically into the required inventory accounting records. As indicated above a punched tape of quantities shipped is obtained as a by-product of the Cardatype operation. This tape represents actual shipments to a branch unless central warehouse stock is out of step with the central Kardex. The transfer into the accounting records is accomplished as follows. Each punched tape representing a branch shipment is processed mechanically from tape to card. The shipping document for the corresponding branch shipment is reviewed in the central Tabulating Department for any warehouse corrections in the quantities shipped. When correction of an item is necessary the corresponding punched card is destroyed and a new card for the correct quantity is key punched. At the month end a summary card for each product and branch is produced on the IBM Accumulating Reproducer. The summary card represents the total quantity of a product shipped to a particular branch during the month. The summary cards are collated with the inventory cost cards and are

processed through an IBM Calculator to apply inventory cost. A tabulation of plant to branch transfers is then prepared on an IBM Accounting Machine. The summary cards represent charges to branch inventories. By reproducing the summary cards we obtain a second deck of cards representing credits to the central inventory.

Conclusion

Any method of replenishing branch stocks is closely related to management's desire to keep inventories at a controlled level. The development of a punched card system and the use of current seasonal inventory levels has not only resulted in savings of clerical effort and in a shorter replenishment cycle but has also brought forth definite operating advantages. The turnover of branch stocks was increased and overstocking of merchandise in the branches was halted. This in turn has considerably improved the problem of outdated stocks, reduced the amount of returned goods and enabled us to keep branches stocked with fresh merchandise.

FOR FURTHER READING

A TABULATING METHOD OF INVENTORY CONTROL, by Kasney & Bristol, N.A.C.A. Bulletin, April 1956.

FLEXIBLE INVENTORY CONTROL BY MECHANIZATION, by F. E. Klecan, N.A.C.A. Bulletin, April 1956.

STREAMLINED INVENTORY CONTROL, by Herbert J. Richmond, The Controller, April 1956.

Student Section . . .

EXAMINATIONS, 1956
ACCOUNTING I

Comments by C. C. Gourlay

QUESTION II (20 marks)

On December 31, 1954, the accountant of the Harris Piano Company had determined the profit for the year to be $18,757.50. A check disclosed the following information relating to the determination of profit:—

1. The total opening inventory and purchases of store supplies was charged to Selling Expenses, although $350.00 of these supplies were still on hand.
2. An insurance policy with a premium of $900.00 per annum dated July 1, 1954, was charged to Insurance Expense.
3. Included in the advertising expense account was a debit of $600 in October for space in a weekly publication. The agreement provides that the space be used in uniform amounts in 52 consecutive issues. As of December 31, 1954, advertisements had appeared in 13 issues.
4. A 90-day non-interest bearing note for $3,650 had been discounted on the date of issuance, November 15, 1954. The discount rate was 6%. This discount was charged to Interest Expense.
5. On November 1, 1954, the Harris Piano Company had issued a four-months 5% note to the Regis Company in payment of their account of $2,000. No interest expense was recorded.
6. Included in the assets is the following Notes Receivable for which interest income was not recorded:
   30 days, 6%, $1,460.00, dated December 2nd, 1954.
7. The following accrued salaries for the period December 27-31 were ignored: Sales salaries $720.00: Office salaries $105.00.
8. On October 1, 1954, the Harris Piano Company had rented a warehouse for $1,200 for a year. They had paid six months' rent in advance and this item was charged to rent expense.
9. Real estate taxes are payable in quarterly instalments of $1,240.00. The payment due November 30th for the quarter ended 30th November has been paid, but no accrual has been set up for the month of December.
10. The physical inventory count had shown a balance of $17,450. This was recorded on the books as $14,750.

REQUIRED:

(a) Give the necessary general journal entries to adjust for these disclosures.

(b) Prepare a statement showing the corrected profit.
(Interest computations are to be based upon a 365 day year.)

SOLUTION TO QUESTION II.

1. Stores Supplies
   or
   Prepaid supplies ..... $ 350.00
   Selling expense ..... $ 350.00
   To correct and set up inventory of store supplies.

2. Prepaid insurance
   or
   Prepaid supplies ..... $ 450.00
   Insurance Expense ..... $ 450.00
   To set up prepaid insurance.

3. Prepaid advertising
   or
   Prepaid supplies ..... $ 450.00
   Advertising Expense ..... $ 450.00
   To correct advertising expense.

4. Prepaid interest expense ..... $ 28.20
   Interest expense ..... $ 28.20
   To correct the interest expense account and set up prepaid interest.

$$\frac{47}{365} \times \frac{6}{100} \times 3650 = \$28.20$$

5. Interest expense ..... $ 16.44
   Accrued Int. payable ..... $ 16.44
   To set up interest expense on note issued to Regis Company.

$$\frac{60}{365} \times \frac{5}{100} \times 2000 = \$16.44$$

6. Interest Receivable ..... $ 6.96
   Interest Income ..... $ 6.96
   To record interest receivable on the one note.

$$\frac{29}{365} \times \frac{6}{100} \times 1460 = \$6.96$$

7. Sales salary expense ..... $ 720.00
   Office salaries expense 105.00
   Accrued salaries payable ..... $ 825.00
   To record accrued salaries.

8. Prepaid rent ..... $ 300.00
   Rent expense ..... $ 300.00
   To record prepaid rent on warehouse.

9. Real estate taxes expense ..... $ 310.00
   Taxes payable ..... $ 310.00
   To record accrued taxes.

10. Inventory $2,700.00
    Profit and loss ..... $ 2,700.00

To correct error of inventory.

Corrected Profit and Loss

Balance		$ 18,757.50
Add	$ 350.00	
	450.00	
	450.00	
	28.20	
	300.00	
	310.00	
	2,700.00	4,595.16
		23,352.66
Deduct	16.44	
	825.00	841.44
Corrected Profit		$ 22,511.22

COMMENT:

Many students had trouble handling some of the entries. Where arithmetic computations regarding interest are concerned the results were pathetic. I feel these students should at least be able to handle such problems as were given.

ACCOUNTING II

Comments by Prof. J. D. Campbell

QUESTION II (18 marks)

The A Co., Ltd., was incorporated on the 4th of February, 1955, under The Companies Act. The terms of the charter authorized share capital as follows:—

5,000 5% preferred shares @ par value of $100 each
and 30,000 no par value common shares.

From the date of incorporation to 31st May, 1955, the following transactions re the allotment and issue of capital stock occurred:

4th February, 1955—6 common shares allotted and issued to the directors of the company at $15 each and the cash received from same.

5th February, 1955—2,500 preferred shares offered for sale at 101.

3rd April, 1955—Applications received for 3,000 preferred shares together with a deposit of $10 per share on application.

6th April, 1955—2,500 preferred shares allotted to subscribers with request for further payment of $25 per share. Cash received on applications accepted deposited.

7th April, 1955—Refund made of deposits on applications NOT accepted.

10th April, 1955—All calls due on allotted shares received and deposited.

10th April, 1955—All shares allotted were issued.

16th April, 1955—10,000 no par value common shares issued for land and building taken over at a value of $120,000.

21st April, 1955—10,000 no par value common shares offered for sale at $15 each.

25th April, 1955—Applications received for 15,000 no par value common shares.
27th April, 1955—10,000 no par value common shares allotted.
30th April, 1955—Cash received for common shares allotted and shares issued. 20% of cash received was credited to Distributable Surplus, as per resolution of the directors.
13th May, 1955—Further call made of $45 per share on preferred shares.
31st May, 1955—Received and deposited three-quarters of the cash due in respect of Call of 13th May.

REQUIRED:

(a) Journal entries, complete with narratives, to record the foregoing transactions.

(b) Balance sheet as at 31st May, 1955.

SOLUTION TO QUESTION II.

(a) **A Co., Ltd.**

1955				
Feb.	4	Cash	90	
		Capital stock issued—common, n.p.v.		90
		To record issue of 6 shares of common at $15.		
Apr.	3	Cash	30,000	
		Applicants—preferred		30,000
		Application of public for 3,000 preferred at 101 together with deposit of $10 per share.		
Apr.	6	Applicants—preferred	25,000	
		Subscribers—preferred	62,500	
		Capital stock allotted—preferred..		87,500
		Allotment of 2,500 @ 101 and receipt of $10 per share with further call of $25 per share.		
Apr.	7	Applicants—preferred	5,000	
		Cash		5,000
		Refund of deposit to unsuccessful applicants.		
Apr.	10	Cash	62,500	
		Subscribers—preferred		62,500
		Receipt of call of $25 per share.		
Apr.	10	Uncalled subscription—preferred	165,000	
		Capital stock allotted—preferred	87,500	
		Capital stock issued—preferred ..		250,000
		Premium on preferred stock		2,500
		Issue of 2,500 preferred shares and allotted and uncalled subscriptions thereon.		

Apr. 16	Land and building	120,000	
	Capital stock—common n.p.v.		120,000
	10,000 fully paid common shares in payment for land and buildings.		
Apr. 27	Subscribers—common	150,000	
	Capital stock allotted—common n.p.v.		150,000
	Allottment of 10,000 shares at $15.		
Apr. 30	Cash	150,000	
	Subscribers—common		150,000
	Receipt of cash for common shares allotted.		
Apr. 30	Capital stock allotted — common n.p.v.	150,000	
	Capital stocks issued — common n.p.v.		120,000
	Distributable surplus		30,000
	Issue of 10,000 n.p.v. common shares at $15 per share and the apportionment of 20% of the cash received therefrom to distributable surplus as per resolution of directors.		
May 13	Subscribers preferred—Call No. 1....	112,500	
	Uncalled subscriptions—preferred		112,500
	Call this date of $45 per share on 2,500 shares.		
May 31	Cash	84,375	
	Subscribers preferred—Call No. 1		84,375
	Receipt of cash from Call No. 1.		

A Co., Ltd.

Balance Sheet as at May, 1955

Assets

Cash in Bank	$ 321,965	
Land and Buildings	120,000	
		$ 441,965

Liabilities

Capital stock

Authorized:

5,000 5% preferred shares p.v. 100

30,000 common shares n.p.v.

Issued:

2,500 preferred shares ..... $ 250,000

Less—uncalled	$ 52,500		
—unpaid calls	28,125	80,625	
		$ 169,375	
Premium on preferred shares		2,500	
		$ 171,875	
20,006 common shares		240,090	
Distributable surplus		30,000	
			$ 441,965

COMMENT:

Many of the students encountered difficulty with this question and numerous comments were offered to the effect that this had not been included in their course. Where the student attempted the question the results were satisfactory in most cases. In marking the question the student was not penalized if he used terminology other than that indicated in the solution or presented the data in a manner different than that indicated in the solution, providing the accounts which were used resulted in the required end product.